In the north Pacific coast States gales were attended by snow and severe cold. At Vancouver, B. C., an unprecedented fall of snow for the season was reported. The gales, the snow and rain, and the temperature conditions were accurately forecast by the Weather Bureau.

An unusual and notable feature of the month was the occurrence of tornadic storms on the 20th in northern Arkansas, northern Mississippi, and eastern and middle Tennessee. These storms developed in the south quadrants of a general storm, the center of which moved during the 20th from Oklahoma to central Illinois, and passed thence over the Lake region during the 21st. The rain and the lake gales which attended this storm were forecast. As regards the tornadic storms referred to it is not possible, even in the presence of conditions which are recognized as being most favorable to their origin, to determine whether storms of this class will actually develop; and if it were possible to arrive at this determination the area, in any part of which their development is equally favored, is so great that the locality or even the State in which the tornadoes will occur can not be defined.

SPECIAL FORECASTS.

The only long-range forecasts of the month were made for election day, November 6. The first of these was issued November 3, and was worded as follows:

Present conditions point to fair weather and moderate temperature on Tuesday, November 6, over all districts east of the Mississippi River. From the Mississippi River to the Pacific coast present conditions are also favorable for fair weather, except on the middle and north Pacific coasts, where there may be rain.

This was followed on the 4th by the following:

For the first time in ten days the weather map shows a clear sky over the whole region from the Pacific to the Atlantic, except over a small area on the middle Atlantic coast, where some rain is falling as a result of a severe storm, the center of which is off Hatteras. The pressure is high over the western half of the country. These conditions will surely give clear, fine weather and pleasant temperature in all States on Monday, except possibly showers on the immediate Atlantic coast line. While it is possible for a storm to develop somewhere in this broad area by Tuesday, the conditions are unusually favorable for the continuation of fine weather for Monday over and throughout Tuesday.

On the morning of the 6th the prevailing weather conditions of the country were summarized as follows:

It is seldom that any day opens without a drop of rain falling anywhere within the area of the United States. Such is the remarkable condition this morning. With the exception of cloudiness over southern Wisconsin, northern Illinois, and eastern Iowa, the sky is clear with pleasant temperature everywhere. The showery condition which yesterday covered New York and New England has moved away as was expected, and all portions of New York and New England are certain to have fine weather during the day. The cloudiness previously referred to as being in Iowa and contiguous States is the result of a storm forming over western Iowa, which will probably result in the beginning of precipitation late to-night or to-morrow in Iowa, the central Mississippi valley and upper Lake region, but the weather will doubtless remain fair until after the closing of the polls.

On the morning of the 9th the following special forecast was telegraphed to Portland, Me., Boston, New York, Philadelphia, Baltimore, and Norfolk:

Severe gales setting in from southeast and going to west and northwest will be encountered along the steamer tracks west of Newfoundland to-night, and over and near the Grand Banks Saturday.

During the 9th heavy gales prevailed along the middle Atlantic and New England coasts, and the wind increased to a strong gale off the Nova Scotia coast during the night of the 9th. Unusually severe south shifting to west gales continued over Nova Scotia during the 10th, and south gales set in over Newfoundland and the Grand Banks, shifting to westerly by night.

The Yarmouth Steamship Company's side-wheel steamer *City of Monticello* struck on a reef at the entrance of the Bay of Fundy the morning of the 10th and sank. The passengers and crew numbered 37, and all except 4 were drowned. The steamer left St. John, N. B., at 11 a. m. of the 9th bound for Halifax, N. S. During the day and night the wind increased in force. When off Chegoggin Point she struck a reef and was soon completely wrecked on the rocks.

On the morning of the 26th, when a storm of marked intensity was central over the interior of the Middle Atlantic States, the following special forecast was telegraphed to Portland, Me., Boston, New York, Philadelphia, Baltimore, and Norfolk, and published on the daily weather maps issued at those places:

Severe gales will shift to northwest off the middle Atlantic coast today and off the New England coast to-night. Dangerous southeast gales will shift to westerly over the Banks of Newfoundland Tuesday.

By the morning of the 27th the storm center had advanced to the south Nova Scotia coast, and by the following morning had passed to the east of Newfoundland.

On the whole the month was marked by exceptionally severe weather along the transatlantic steamship tracks.

On the 25th and 26th the streams of the Ohio Valley were swollen by heavy rains.

At Pittsburg, Pa., the Weather Bureau issued a flood warning at 2 p. m. of the 26th, announcing a 25-foot stage, or higher, by midnight. The night of the 26th a second warning was issued for a 28-foot stage by noon of the 27th. The maximum stage, 27.7 feet, was reached at 10 a. m., of the 27th.

General attention was given to the warnings, and property to the estimated value of at least $1,000,000, was saved by removal to places of safety before the crest of the flood reached Pittsburg.

CHICAGO FORECAST DISTRICT.

No very severe storms occurred in the upper Lake region. Storm warnings were ordered in advance of the upper lake disturbances of 1st, 3d, 8th, 11th, and 12th, the warnings of the 12th being continued forty-eight hours, and at some stations for a longer period. The stormy weather which continued from the 17th to the 20th was amply covered by warnings, and on the morning of the 24th warnings were issued for the greater part of Lakes Michigan and Huron on account of a storm in the lower Mississippi Valley which moved eastward and northward, causing high winds over the southern parts of the lakes.

No cold waves swept the entire district. Warnings were, however, issued generally in advance of marked falls in temperature.—*H. J. Cox, Professor.*

SAN FRANCISCO FORECAST DISTRICT.

On November 14 conditions were such as to warrant the forecast of rain for northern California and threatening weather in southern California, which forecast was continued on the 15th. By November 16 the storm, which was destined to be noteworthy, was fairly in upon the north Pacific coast, and heavy rain was reported from San Francisco northward. On the morning of the 16th storm warnings were displayed from San Francisco to Eureka and all southern seaports were advised of a storm off the Washington coast. Rain was forecast for southern California the morning of the 16th. By November 17 heavy rains had fallen from San Diego to Neah Bay. The value of this rain was almost beyond estimation. Rain forecasts were continued Sunday and Monday, and north and east bound travelers were specially warned of

low temperatures and snow along their routes. On the 20th forecasts of high winds were sent to Nevada and Utah. On November 21 the morning forecast for southern California was "heavy rain this afternoon, to-night, and Thursday, with snow in the mountains and dangerously high southerly winds." High winds were also forecast for other parts of the district. Shipping and railroad interests were advised of heavy rains and high southerly winds. The forecasts were fully justified. The clearing weather which followed the storm was also accurately forecast.—*A. G. McAdie, Forecast Official.*

PORTLAND, OREG., FORECAST DISTRICT.

Following the storm of the 1st an unusually long period of fine weather prevailed, which terminated in a severe cold spell, attended by snow and blustering northeast winds that overspread the North Pacific States the night of the 17th and continued until the 22d. Freezing temperatures were experienced to the coast line for three days, and east of the Cascade Mountains zero temperature was reported at Spokane and Walla Walla. Both the cold weather and snow were accurately forecast, as was also the break to warmer, which occurred several days later. The warnings of cold were the means of saving several big shipments of potatoes that otherwise would have been frozen. Marine interests were kept fully advised of the approach of gales and high winds.—*E. A. Beals, Forecast Official.*

AREAS OF HIGH AND LOW PRESSURE.

During the month there were charted eleven highs and sixteen lows. A brief description of their movements and more prominent characteristics is given herewith.

Highs.—For the first time since May, 1900, with the exception of a portion of July, the highs exhibited a southeastward tendency, and the paths of a majority of them at times reached below the fortieth parallel. Nos. I, III, VII, and XI originated in the extreme central west, but pursued widely different paths. No. I moved from the Indian Territory northeastward to Ontario, and thence along a somewhat devious path to the Atlantic Ocean by way of Cape Breton Island. No. III originated in southeastern Wyoming and moved almost due southward through central Texas into the Gulf of Mexico. No. VII moved from the Kansas River Valley to West Virginia in twenty-four hours, and there disappeared, while No. XI maintained a fairly direct eastward movement from southeastern Wyoming to the Virginia coast. No. II first appeared on the Washington coast, moved eastward to North Dakota, and thence south-southeastward through Missouri and Mississippi into the Gulf of Mexico. No. IV moved from Columbia, N. W. T., to the Saskatchewan Valley, thence southeastward to the lower Ohio Valley, and thence eastward off the southern New Jersey coast. No. V followed much the same path as No. IV. Nos. VI and VIII moved across the extreme north from Alberta to the Atlantic Ocean. No. X was first noticed over northern Lake Superior, and from that section eastward followed very nearly in the paths of Nos. VI and VIII.

The characteristic winter type of high prevailed over the Plateau region except from the 14th to the 22d, inclusive, continuing at the close of the month.

Lows.—The lows were numerous and fairly regular in movement. Nos. I, V, XIV, XV, and XVI, moved eastward over the extreme north, No. I coming in over the Oregon coast. No. XVI dissipated in western Ontario, while the remaining three passed out the St. Lawrence Valley. During its progress No. V dipped down into the southern portion of the upper Lake region, afterward resuming its easterly course. Nos. XI, XII, and XIII, originated in the central Rocky Mountain region, Nos. XI and XII passing into the Atlantic by way of the St. Lawrence Valley and Nova Scotia. No. XIII first traveled southeastward through the Southern States, turning northeastward after reaching central Alabama. It passed into the ocean off the southern New Jersey coast, and was afterward noted at Halifax, N. S., Sydney, C. B. I., and St. Johns, N. F. No. X originated in southwestern Montana, and moved down the eastern slope of the Rocky Mountains to central Texas, where it disappeared. Nos. IV and IX originated in the middle Mississippi Valley, the former moving to eastern Lake Erie, and thence south-southeastward to the Virginia coast, and the latter to the Atlantic Ocean just north of latitude 45°. No. VI was a local disturbance of great intensity that moved from southeastern New York through New England to the country north of the Gulf of St. Lawrence. Nos. II and VIII originated in the south Atlantic States, and both were last noticed in the vicinity of Bermuda.

From the morning of the 15th to the evening of the 19th a low of decided character was persistent near the Oregon, Washington, and British Columbia coasts, the barometer readings ranging in the neighborhood of 29.50 inches, and the depression extending into the north and middle Plateau region. It began to move southward during the night of the 19th, disappearing off the California coast during the night of the 20th.—*H. C. Frankenfield, Forecast Official.*

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long W.	Length.	Duration.	Daily.	Hourly.
High areas.		°	°		°	°	*Miles.*	*Days.*	*Miles.*	*Miles.*
I	1, a.m.	34	96	4, a.m.	46	60	2,500	3.0	833	34.7
II	6, a.m.	47	123	10, p.m.	30	88	2,440	4.5	542	22.6
III	8, p.m.	48	122	12, p.m.	28	98	2,745	4.0	686	28.6
IV	12, a.m.	51	120	15, a.m.	40	75	2,725	3.0	908	37.8
V	14, a.m.	53	109	17, p.m.	41	70	2,400	3.5	686	28.6
VI	16, p.m.	54	114	20, a.m.	48	54	2,750	3.0	917	38.2
VII	21, a.m.	39	95	22, a.m.	38	80	800	1.0	800	33.3
VIII	22, p.m.	50	108	25, p.m.	46	60	2,265	3.0	755	31.5
IX	23, p.m.	50	110	29, a.m.	36	84	2,775	4.5	617	25.7
X	26, p.m.	48	85	29, p.m.	46	60	1,345	3.0	448	18.7
XI	28, p.m.	42	105	1, a.m.*	37	76	1,715	2.5	686	28.6
Sums							24,460	35.0	7,878	328.3
Mean of 11 paths							2,224		716	29.8
Mean of 35 days									699	29.1
Low areas.										
I	1, p.m.	45	117	4, p m.	48	68	2,825	3.0	942	39.2
II	3, a.m.	34	82	5, p.m.	32	65	1,075	2.5	430	17.9
III	5, a.m.	45	73	6, a.m.	46	60	700	1.0	700	29.2
IV	6, a.m.	41	96	8, a.m.	37	76	1,400	2.0	700	29.2
V	7, p.m.	54	114	12, a.m.	48	68	2,490	4.5	553	23.0
VI	8, a.m.	41	74	10, a.m.	48	68	650	2.0	325	13.5
VII	11, p.m.	48	85	13, a.m.	48	68	900	1.0	900	37.5
VIII	11, p.m.	32	81	13, a.m.	32	65	1,000	1.5	667	27.8
IX	12, p.m.	43	91	14, p m.	46	60	1,700	2.0	850	35.4
X	13, p.m.	47	112	15, a.m.	31	101	1,325	1.5	883	36.8
XI	17, a.m.	41	107	21, p.m.	48	68	2,425	4 5	539	22.5
XII	21, p.m.	40	105	24, a.m.	48	54	2,675	2.5	1,070	44.6
XIII	21, p.m.	41	111	28, a.m. 25, a.m.	48 40	54 80	3,840 2,325	6.5 3.5	591 664	24.6 27.7
XIV	25, a.m.	53	121	29, a.m.	45	80	1,600	4.0	400	16.7
XV	27, p.m.	54	114	1, a.m.*	46	78	1,800	3.5	514	21.4
XVI	30, a.m.	54	114	2, p.m.*	47	85	1,550	2.5	620	25.8
Sums							30,280	48.0	11,348	472.8
Mean of 17 paths							1,781		667	27.8
Mean of 48 days									631	26.3

*December.

RIVERS AND FLOODS.

The Mississippi River from its source to the mouth of the Illinois River was somewhat lower than during October, 1900; from the mouth of the Illinois to the mouth of the Ohio there was but little change, while below the mouth of the Ohio stages